Nutrition News
PUBLISHED BY NATIONAL DAIRY COUNCIL · CHICAGO

FOOD AND OPTIMUM HEALTH

Clifford J. Barborka, M. D.
Department of Medicine
Northwestern University

Journals, bookshelves, newspapers, and radio broadcasts are overflowing with information about food. Some of this information is worthwhile and some is not. Within the last few years our scientific knowledge of vitamins, minerals, and other constituents of food has increased tremendously. Coincident with this advance, which has developed a more thorough appreciation of the use of properly selected foods in the promotion of health, the food fakirs, faddists, and pseudoscientists broadcast to the unsuspecting public a tremendous volume of misinformation.

The public exhibits a surprisingly great concern, in some instances laughable, in others tragic, and places diet therapy in the category of patent medicines. Nevertheless, our newer knowledge of nutrition is recognized today as of great importance in relation to health and disease.

Evolution of Our Diet

When one delves into the study of man, he emerges with the feeling that there have been very definite epochs in the evolution of our diet. Races of people have changed very radically their habits of eating by some unforeseen circumstance. Custom determines the arrangement of the meals and kinds of foods eaten, but the experience of the race governs the custom.

In reflecting upon the food habits of our ancestors one may feel that they derived adequate nourishment without knowing the scientific facts of nutrition. This, perhaps, is true, but great changes have taken place in the past thirty years in the production and selection of food. The assumption is expressed often that the normal person, when free to choose, will select by instinct the foods best suited to his needs. Within definite limits this may be true, but generally speaking the question is not so much what he will select, as it is that economic force and necessity make him get what he can for sufficient nourishment.

Food and Health

A large majority of adults who consult the average physician are interested in food. Food is recognized as a most important social factor in the life of every human being. Events are occurring today that indicate how international relationships are affected by our universal dependence upon the adequate supply and distribution of food.

At present the mild or latent forms of the vitamin deficiencies are more important in practice than are the fully developed cases. The latter are uncommon, are easily recognized, and are usually promptly and adequately treated. Minimal or mild forms of these diseases, because of their insidious effect, constitute a serious problem inasmuch as their diagnosis is often difficult and uncertain. Nevertheless, there is available today much new knowledge of the vitamins which is applicable to the diagnosis and study of the milder forms of their deficiencies in the patients.

A problem that concerns each of us today is what we can do to contribute to the safety of our country. If our workers are malnourished they cannot be efficient in producing what we need for defense. Yet every survey of nutrition, by whatever method conducted, shows that malnutrition in this country

Doctor Barborka

is widespread and serious. Forty per cent of our people are not getting a diet adequate to maintain optimum health and vigor. Eight out of every ten of this forty per cent in our nation do not have an income sufficient to purchase a diet adequate in amount and kind: this in spite of the fact that the foods of which the nation has an apparent surplus are those in which the diet of so many is deficient—milk, milk products, citrus fruits, green vegetables, and meat.

When all the people of the United States understand the known facts regarding diet and nutrition and live accordingly, many of the present public health problems will be solved. With the final establishment of an intensive national drive, with rigid scientific controls, and the education of the public to use the food we have, health will improve and the proper fitness of our manpower will have been attained.

Glances AT NUTRITION RESEARCH

A nation-wide program of nutrition education will soon be under way as part of our national defense. Basic to such a program is nutrition research which discovers the functions and sources of the various food essentials.

Riboflavin — Milk is the richest food source of riboflavin, according to the Council on Foods and Nutrition of the American Medical Association. One quart of milk contains about 2,000 micrograms of riboflavin, which is equivalent to the adult daily requirement. The requirement of children and infants is somewhat less.

—Hygeia, Feb. 1941, page 116.

Vitamins in Milk — The vitamin B complex content of milk is not affected by the amount of these vitamins in the cow's rations. Apparently thiamine, riboflavin, and pyridoxine are formed in the rumen (first stomach) of the cow and are transferred to the milk.

In the experiments reported, cows were fed rations deficient in one of these vitamins. In each case it was found that the vitamin was present in the rumen, and the milk contained a normal amount of the vitamin in spite of the deficient ration.

—J. Nutrition 20:527 and 541 (Dec.) 1940, and 21:163 (Feb.) 1941.

Dietary Survey — A survey of two adjacent areas in Kentucky has revealed interesting facts about pellagra. One is a coal camp area where pellagra is prevalent; the other is a rural region where pellagra is rare.

The families in both areas were asked about their food habits during March, April, and May because this is the low diet season of the year with a scarcity of both fresh and canned foods and a low cash income.

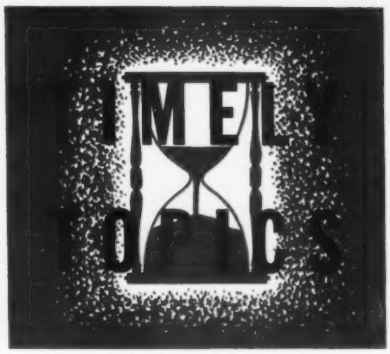
The consumption of the pellagra-producing diet—fat pork, beans, corn meal—was about the same in both areas. However, the group which was free of pellagra used more fresh milk, lean pork, eggs, and chickens. The use of milk and/or eggs four or more times a week was reported by 90 per cent of the families in the rural area as compared with only 47 per cent of the families in the coal camp. Only two per cent of the rural families used no milk and/or eggs, but 24 per cent of the families in the coal camp used none of these pellagra-preventing foods.

—J. Amer. Med. Assn. 116:912 (March 8) 1941.

Calcium Deficiency — A detailed study of the effects of severe calcium deficiency in growing rats showed that the first noticeable effect was decreased growth rate accompanied by decreased appetite. Other symptoms were reduced activity; easily broken bones; internal hemorrhages; paralysis of the hind quarters; reduced span of life.

Calcium content of the blood was rapidly reduced, and the ash and calcium of the bone was only about one-half the normal. Most of the rats became normal a few weeks after they were supplied food with an adequate amount of calcium.

—J. Nutrition 21:61 and 75 (January) 1941.



Physical examinations for defense forces are tending to show the great need for a national nutrition program. About 15 per cent of the 14,500 men who answered the first summons for one year's military training, were reported to have been rejected because of physical deficiencies. Later figures have run considerably higher—20 to 30 per cent in most localities. Several of the causes of rejection are traceable to poor nutrition.

Miss Mary I. Barber, president of the American Dietetic Association, has been assigned the task of assisting in the preparation of Army menus. She will work closely with the Office of the Quartermaster General, U. S. War Department, and will visit many Army camps throughout the country.

White flour is now being "enriched" with vitamins and minerals—thiamine, nicotinic acid, and iron. These are the chief food factors which are removed in making refined white flour.

It is expected that breads and other foods made from the enriched flour will probably make their greatest contribution to low-cost diets, which are most likely to be low in the vitamins and minerals that the enriched flour will supply.

Minimum standards for enriched flour per pound are: thiamine, 1.66 mg.; nicotinic acid, 6.15 mg.; iron, 6.15 mg.

VITAMIN A IN THE NUTRITION OF ADULTS

By Dr. Lela E. Booher
Senior Nutrition Chemist, Bureau of Home Economics
U. S. Department of Agriculture

Vitamin A is a fundamental requirement for persons of all ages. This vitamin is abundant in nature, but not at all evenly distributed in our common everyday foods. Vitamin A and the yellow carotenoids which can be converted into vitamin A in the body can be stored in the liver of man and many species of animals to be used when extra supplies are needed or when there is a temporary shortage in the diet.

Vitamin A Deficiency

The first detectable sign of vitamin A deficiency is the development of night blindness or an inability of the eyes to adjust themselves properly to dim light. In the case of children, this sign of vitamin A deficiency develops well in advance of an interference with growth. With prolonged deficiency of vitamin A, marked xerophthalmia occurs, which can eventually lead to total blindness.

Vitamin A has sometimes been referred to as the anti-infective vitamin. In our work with adults provided with less than 5 per cent of their minimum vitamin A requirements often for as long as 5 months or until they became markedly night blind, no increase in infections was noted. This does not mean that reserves of vitamin A are unimportant. Dr. P. C. Jeans, of Children's Hospital, Iowa City, has recently made the interesting observation that when infections have taken hold, the vitamin A reserves of the body are rapidly depleted.

Vitamin A Requirements

How much vitamin A, then, does an average adult need? In a study of about 20 volunteer subjects employed in the U. S. Department of Agriculture, the minimum daily allowance of vitamin A required to prevent night blindness in adults was about 4,000 International Units. This allowance assumes that about 70 per cent of the vitamin A value of the diet is derived from the carotene in fruits and vegetables and about 30 per cent from foods of animal origin, where the carotene has already been transformed in whole or in part into vitamin A. This is a normal distribution for the vitamin A values of American dietaries.

Further experiments with adults have shown that the most efficient and economical way to build up a bodily reserve of vitamin A is to eat a varied diet that will supply around a 50 to 100 per cent excess over the minimum daily requirement for vitamin A, and to provide this excess regularly. An occasional massive dose of vitamin A will not be as effective or as economical for this purpose.

Vitamin A in Foods

The nutrition staff of this bureau has recently made an extensive study of the vitamin A values of a wide variety of American food items. The following list of food items in the quantities indicated can be used to check an adult's daily vitamin A supply against the average daily minimum requirement of 4,000 International Units or against 6,000 to 8,000 International Units which would provide for 50 to 100 per cent excess for building up a vitamin A reserve:

Apricots, dried (6 halves)	2,190
Banana (1 small)	400
Beans, snap (½ cup, cooked)	1,200
Butter (5 tablespoons)	2,000-3,750
Carrot (1 large)	10,000
Cheese, American (2 oz.)	720
Eggs (2)	750-1,500
Milk, whole (1 quart)	900-2,200
Milk, whole, powdered (4½ oz.)	2,100
Peach, yellow (1 medium)	1,560
Peas, green (½ cup)	490
Prunes (5 medium)	780
Spinach or other leafy green vegetable (½ cup, cooked)	3,600
Sweet potato (½ medium)	8,000-12,000

AN ADVENTURE IN PRACTICAL NUTRITION

By Miss Elinor Henderson
Home Economics Instructor, University High School
Chapel Hill, N. C.

One of the chief functions of education is to produce better-integrated, happier, and healthier individuals. Recognizing this, the administration and faculty of Chapel Hill High School inaugurated last year an adjustment service, the purpose of which was to help each student to acquire a healthy body, an attractive appearance, and an emotionally stable and psychologically adjusted personality.

A staff of experts contributed their time and talent without charge. The medical division was composed of two general physicians, an endocrinologist, and a dermatologist. Many other well-known specialists from the two university towns, Chapel Hill and Durham, made up a psychology division, a physical education division, a speech clinic, and a dress staff. A beauty shop in the city offered a hair stylist and makeup expert at the lowest possible prices. Photographs were made available by the leading photographer in Chapel Hill. Even one of the drug stores, officially chosen for the project, offered to supply prescriptions at minimum rates.

Having secured parental permission to enroll for the course, one hundred girls filled out application blanks. Every girl was given a free physical examination at the beginning. Additional x-ray and basal metabolism tests showed up difficulties which had been present, though undiscovered, for some time. As a result of these findings, school health authorities who had hitherto devoted most of their time to the elementary schools in the town, reorganized their program to include the high school students as well.

Of the one hundred girls enrolled, thirty-five cases of skin disorder (or acne) and twenty-five cases of extreme underweight and overweight received particular attention from the medical staff. Special diets for these groups were recommended by the doctors and worked out by the home economics teacher with the help of the head dietitian of a large hospital in the neighboring city.

Overweight diets were planned with a minimum allowance of sweets, fats, breads, and cereals. Care was taken

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DID YOU KNOW

—that Tibetan monasteries mold images of their favorite gods from butter? Yak butter, mixed with colored powders, is used for these images which are displayed at the annual Winter Butter Festival.

—that dairy products are at the bottom of the list in the Japanese dietary? Rice tops the list, with 354 pounds consumed per capita. Less than 4 per cent of the caloric intake of a Japanese is of animal origin.

—that little figures made of cheese are prized possessions of Italian children at the holiday season? The figures are molded by hand, dried, and hardened.

—that a package of crystalline vitamins, the size of a two-pound box of candy, was presented to Dr. Tung Shen by Cornell University students, to enable him to study nutrition lacks of Chinese soldiers?

—that canned fruit and vegetable juices were not even mentioned in the census of 1914? The 1940 census reveals that today the value of fruit and vegetable juices annually canned and bottled is about $50,000,000.

—that "prolon" is a new name for casein wool, the newest synthetic fabric? Prolon is made from casein obtained from milk, soybean, or other sources.

—that the waffle-like markings on ice cream cones are said to be a survival from the first cone, which was a waffle rolled up to hold an ice cream ball?

THINGS YOU'LL LIKE TO READ

TREATMENT BY DIET — Clifford J. Barborka. J. B. Lippincott Co., 1939. $5.00. (New edition in preparation.)

Dr. Barborka's book gives physicians a simple, practical, and workable method of prescribing diets and applying treatment by diet to health and disease.

THE AMERICAN AND HIS FOOD— Richard O. Cummings. University of Chicago Press, 1941. $2.50.

As the title suggests, this book tells about the kind of meals Americans used to eat and why they eat such different kinds today. The parts played by many factors in changing the eating habits of the nation are explained.

FEEDING OUR TEETH — Mary S. Rose and Bertlyn Bosley. Bureau of Publications, Teachers College, Columbia University, New York, 1940. 25¢.

This is a nutrition unit for third and fourth grades. Ten lessons on development and care of teeth are given.

A TRIBUTE

With the passing of Dr. Mary Swartz Rose on February 1, 1941, the nutrition world lost one of its greatest teachers and scientists. Dr. Rose, through her writing and teaching, laid the foundation for the practical application of nutrition to human health and welfare. She was one of the leaders responsible for bringing into being the profession of the dietitian and nutritionist.

Dr. Rose was a member of the Nutrition Commission of the League of Nations, a past president of the American Institute of Nutrition, and a fellow of the American Association for the Advancement of Science and of the American Public Health Association. Since 1933 she had been a member of the Council on Foods and Nutrition of the American Medical Association. After 35 years of service at Teachers College, Columbia University, Dr. Rose had retired last June.

Her textbooks **Feeding the Family, Laboratory Handbook for Dietetics, Foundations of Nutrition,** and **Teaching Nutrition to Boys and Girls** have served for many years as standard source materials for educational work.

HEALTH EDUCATION — Report of the Joint Committee on Health Problems of the National Education Association and the American Medical Association. Revised edition, 1941. Natl. Educ. Assn., 1201 Sixteenth St., N. W., Washington, D. C. $1.50.

Everyone concerned with health education will welcome this comprehensive new volume.

AN ADVENTURE IN PRACTICAL NUTRITION

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to include butter and whole milk as a health precaution. Milk and bouillon at mid-morning, mid-afternoon, and bed-time were taken to satisfy appetites.

Underweights were placed on high calorie diets or on high vitamin diets according to the doctors' prescriptions. At the end of the project, the underweight girls had gained an average of five pounds each. Many of these, by careful attention to diet, rest, exercise, and elimination, continued to gain after the experiment was completed.

The overweight girls, with consistent diet and exercise, lost an average of nine pounds each. All cases of acne were partially cleared up by diet and external treatment combined.

A general interest and improvement in diet throughout the school was reflected in purchases at the student store, where candy sales fell off 35%, and the sale of milk and orange juice increased over 50%. Many students brought milk from home to keep in the Home Economics Department refrigerator until recess. In the total student body a genuine improvement in hair, skin, dress, grooming, and speech-consciousness was evident.

The program was broadly designed with a view to remedying as many defects and removing as many conflicts as were discovered in the students. So well was this aim accomplished in several cases, that the school authorities considered the project worthwhile on this count alone.